

A car accelerates from rest to 25 m/s in 7 seconds. What is the car's acceleration?

$$\bar{a} = \frac{\bar{v}_f - \bar{v}_i}{t_f - t_i}$$

$$\bar{a} = ?$$

$$\bar{v}_i = 0 \text{ m/s}$$

$$\begin{aligned}\bar{a} &= \frac{\bar{v}_f}{t_f} \\ &= \frac{25 \text{ m/s}}{7 \text{ s}}\end{aligned}$$

$$\bar{v}_f = 25 \text{ m/s}$$

$$t_i = 0 \text{ s} \text{ (almost always)}$$

$$t_f = 7 \text{ s}$$

$$= 3.57 \text{ m/s/s forward}$$

A car is traveling at 38 m/s and slows down with an acceleration of -1.54 m/s/s. How much time did the car take to come to rest?

$$\bar{a} = \frac{\bar{v}_f - \bar{v}_i}{t_f - t_i}$$

$$\bar{a} = -1.54 \text{ m/s}^2$$

$$\bar{v}_i = 38 \text{ m/s}$$

$$\bar{v}_f = 0 \text{ m/s}$$

$$\bar{a} = \frac{-\bar{v}_i}{t_f}$$

$$t_i = 0 \text{ s}$$

$$t_f = ?$$

$$\begin{aligned}t_f &= \frac{-\bar{v}_i}{\bar{a}} \\ &= \frac{-38 \text{ m/s}}{-1.54 \text{ m/s}^2} \\ &= 24.7 \text{ s}\end{aligned}$$